PATENT APPLICATION AF

PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

Leo I. RAINER et al.

On Appeal from Group: 3753

Application No.: 09/802,883

Examiner: L. CIRIC

Filed: March 12, 2001

Docket No.: 120538

For: INTEGRATED VENTILATION COOLING SYSTEM

APPEAL BRIEF TRANSMITTAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Attached hereto is our Brief on Appeal in the above-identified application. The fee for the Appeal Brief in the amount of $250 was previously paid on November 28, 2005.

Respectfully submitted,

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BRIEF ON APPEAL

Appeal from Group 3753

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I. REAL PARTY IN INTEREST

The real party in interest for this appeal and the present application is Davis Energy Group, by way of an Assignment recorded in the U.S. Patent and Trademark Office at Reel 015331, Frame 0906.

II. STATEMENT OF RELATED APPEALS AND INTERFERENCES

There are no prior or pending appeals, interferences or judicial proceedings, known to Appellant, Appellant's representative, or the Assignee, that may be related to, or which will directly affect or be directly affected by or have a bearing upon the Board's decision in the pending Appeal.

III. STATUS OF CLAIMS

Claims 1-31 have been canceled.

Claims 32-51 are on appeal.

Claims 32-51 are pending.

Claims 32-44 are rejected.

Claims 45-51 stand withdrawn.

IV. STATUS OF AMENDMENTS

An Amendment After Final Rejection was filed on August 8, 2005. By an Advisory Action dated August 18, 2005, it was indicated that the requested amendments had not been entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention relates to an integrated assembly of devices for providing building heating, ventilation cooling, fresh air ventilation, and air conditioning, and to improvements in controls for operating these devices (page 2, lines 5-7 of the specification).

The devices, and control for operating these devices, employs temperature predictions as a means of providing improved temperature control and comfort, and improved user understandings of the concept of ventilation cooling. It is known that the effective use of outside air for ventilation cooling can reduce the required capacity of air conditioners and reduce their energy consumption by reducing the cooling load. Thus, an object of this invention is to increase consumer and building industry acceptance of ventilation cooling by combining ventilation cooling, air conditioning, and fresh air ventilation into an integrated system that is controlled by a user interface (page 5, lines 21-27).

Independent claim 32 recites a system for using outside ventilation air to maintain indoor comfort and air quality, comprising a sensor system for detecting outdoor and indoor air temperatures, an air delivery system for delivering the outside ventilation air to an interior space, and a controller, operably connected to the sensor system and the air delivery system, that receives an outdoor air temperature and an indoor air temperature detected by the sensor system, stores the detected outdoor air temperature and the detected indoor air temperature detected by the sensor system, calculates a predicted indoor temperature range and a predicted outdoor temperature range based on the stored outdoor air temperature and the stored indoor air temperature, and regulates operation of the air delivery system as a function of predicted indoor and outdoor air temperature ranges and a predetermined indoor air temperature range.

Fig. 1 shows an embodiment of the system recited in independent claim 32 (see page 9, lines 12-14 of the specification). The system includes the sensor system for detecting outdoor and indoor air temperatures. The sensor system as shown in Fig. 1 includes, for

example, an outdoor temperature sensor 5 which connects to a control module 3 by control wires 4 (page 9, lines 18 and 19). The sensor system further includes the wall display unit (WDU 1) that is connected to the control module 3 by wires 2 (page 9, lines 16-19). The WDU 1 includes an indoor air temperature sensor, as is well known in thermostats (page 10, lines 24-27).

Independent claim 32 further recites an air delivery system for delivering outside ventilation air into an interior space. As shown in Fig. 1, an air handling unit (AHU 9) is connected to an outside air damper 12 by a duct 11 (page 9, lines 23-28). The AHU 9 causes outside air to enter the damper 12 at intake 12a, pass through the filter 12d, and flow to a building via supply air outlet 9a that is connected to the ducts that convey cool air to all rooms (interior of the building 31). Excess air pressure from the building interior 31 is relieved through the return air intake 12c to a damper relief opening 12b (page 10, lines 24 - page 11, line 2).

Independent claim 32 further recites a controller, operably connected to the sensor system and the air delivery system. As shown in Fig. 1 and described in the specification, the WDU 1 includes a program code contained in a microprocessor chip in the WDU that determines WDU functions. The WDU is connected to the control module 3 by wires 2. The controller is operably connected to the sensor system described above via wires 2 and 4 and to the air delivery system described above via wires 7 and 14 (see page 9, lines 16-22, Fig. 1). The controller receives an outdoor air temperature and an indoor air temperature detected by the sensor system (see for example, page 10, lines 24-27; page 10, lines 10-13; page 6, line 20 - page 7, line 3).

Independent claim 32 also recites that the controller stores the detected outdoor air temperature and the detected indoor air temperature detected by the sensor system (see, for example, page 10, lines 10-13; page 6, lines 20-24).

Independent claim 32 further recites that the controller calculates a predicted indoor temperature range and a predicted outdoor temperature range based on the stored outdoor air temperature and the stored indoor air temperature (see, for example, page 10, lines 10-13; page 6, lines 20-24).

Further, independent claim 32 recites that the controller regulates operation of the air delivery system as a function of the predicted indoor and outdoor air temperature ranges and a predetermined air temperature range (page 10, line 10 - page 11, line 14; page 6, line 20 - page 7, line 9).

In a preferred embodiment of the invention, a controller regulates ventilation cooling by 1) measuring outdoor and indoor temperatures, 2) employing statistical equations programmed into the controller to predict outdoor and indoor temperatures from previously measured temperatures, and 3) applying predicted temperatures and user temperature settings to control the operation of a damper and a fan motor. User temperature settings may include minimum and maximum acceptable indoor temperatures, the former being the lowest indoor temperature at which outside air below such a temperature will be used for cooling, and the latter being the indoor temperature above which compressor air conditioning will be utilized.

To minimize air conditioner operation during hot weather and to avoid over-cooling during mild weather, the controller adjusts the actual indoor temperature at which ventilation cooling is discontinued based on the predicted temperatures. The controller also operates the ventilation system to achieve lower morning indoor temperatures on hotter days and higher morning temperatures on cooler days (page 6, line 20 – page 7, line 3). The controller may also include a communications link that can be used to obtain weather predictions from weather services for control and display purposes. The controller also operates to control an output for operating a variable speed fan motor for varying airflow rates, and user inputs for establishing independent maximum fan speed settings for ventilation cooling, heating, air conditioning, and

manual fan operation. Thus, the ventilation cooling air flow rates are varied in proportion to the cooling demand (page 7, lines 22-27).

During winter heating operation, the controller varies the speed of the system fan in proportion to a difference between the indoor temperature and a heating temperature setting, thereby conserving fan energy, minimizing drafts and fan noise, and improving temperature control. The controller also maintains indoor air quality using the fan and the damper to deliver a specified volume of fresh outside air each hour the damper is operated to supply the outside air and control the fan to limit the volume of air supplied to a specified volume (page 8, lines 6-13).

The controller operates the air conditioner during early morning hours to pre-cool a building to avoid air conditioner compressor operation during peak utility load periods. The controller also schedules the operation of the air conditioner to prevent use during these utility peak demand periods, using either user time settings or signals communicated by the local electric utility using the communications link (page 9, lines 1-8).

Using indoor and outdoor temperature data stored from the current and previous days, high and low temperature settings, and statistical equations contained in the control module microprocessor program, the predicted indoor temperature range for the next day is computed and displayed by a comfort bar 23 as shown in Fig. 2. When the outdoor temperature sensed by the outdoor air temperature sensor 5 falls below the indoor temperature sensed by the wall display unit by more than a temperature differential set using the wall display unit, the blower motor 15 begins operation and a damper motor 13 is activated. As a result, the air handling unit 9 causes outside air to enter the damper intake 12A, passed through the filter 12D, and flow to the building via supply air outlet 9A that is connected to ducts that convey cool air to all rooms (page 10, line 7 – page 11, line 1). In this way, the controller can regulate the operation of the air delivery system as a function of predicted indoor and outdoor air temperatures and the predetermined indoor air temperature range set at the wall display unit.

Dependent claim 41 further recites an air conditioner, wherein the controller operates the air conditioner during early morning hours to pre-cool a building. The air conditioner includes, for example, a condensing unit 17, a heat exchange coil 10 and piping 19 that carries refrigerant between the condensing unit 17 and the coil 10 (page 10, lines 4-6; page 11, line 10; Fig. 1). The air conditioning unit is described as being operated by the controller during early morning hours to pre-cool a building (page 10, line 4 - page 11, line 14; page 9, lines 1-3; page 9, lines 6-8).

The method steps recited in claim 45, which includes the components of the system recited in independent claim 32, may be seen throughout the specification, and more specifically at those passages cited above regarding independent claim 32.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection are presented for review:

1) Claim 41 is rejected under 35 U.S.C. §112, second paragraph for allegedly representing a "double recitation" of the air delivery system recited in independent claim 32.

2) Claims 32-44 are rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent 4,775,944 to Nakamura.

VII. ARGUMENT

A. Claim 41 Is Not a Double Recitation of Claim 32

The Office Action rejects claim 41 under 35 U.S.C. §112, second paragraph, alleging that the recitation of "further comprising an air conditioner" in claim 41 represents a "double recitation" of the air delivery system recited in independent claim 32. Specifically, it is indicated in the Office Action that "an air conditioning apparatus inherently includes an air delivery system".

35 U.S.C. §112, second paragraph, recites "the specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the Applicant regards as his invention." Because the recitation of dependent claim 41 further narrows the scope of the recitation of claim 32, claim 41 complies with 35 U.S.C. §112 and does not represent a "double recitation" of the air delivery system already recited in independent base claim 32. For example, claim 32 recites "an air delivery system for delivering the outside ventilation air to an interior space" without specifically reciting that the air delivery system comprises any particular units such as an air conditioner of claim 41 or a vapor compression unit or evaporative cooling unit of claim 44. Because an air delivery system, such as that recited in independent claim 32 does not expressly or inherently include an air conditioner, as recited in dependent claim 41, the scope of claim 41 is further narrowed by the recitation of the additional feature of the air conditioner.

Moreover, claim 41 is not a duplicate claim of independent claim 32 because claim 41 further defines the air delivery system by the recitation of the feature "wherein the controller operates the [an] air conditioner during the early morning hours to pre-cool a building." MPEP §706.03(k) acknowledges that Court decisions have confirmed Applicant's right to restate (i.e., by plural claiming) the invention in a reasonable number of ways. A mere difference in scope between claims has been held to be enough. Accordingly, the subject

matter of claim 41 does not represent a "double recitation" of the subject matter recited in independent base claim 32.

Claim 41 thus satisfies all of the requirements of 35 U.S.C. §112, second paragraph. The rejection should thus be reversed.

B. Factual Inquiries to Determine Anticipation Under 35 U.S.C. §102(b)

35 U.S.C. §102(b) recites "a person shall be entitled to a patent unless the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States."

In rejecting claims under 35 U.S.C. §102(b), it is incumbent on the Examiner to establish that each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference to a case citation *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as contained in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

In setting forth the claims which Applicants regard as his invention, an inventor may choose to be his or her own lexicographer by defining, with reasonable clarity, deliberateness and precision, the specific terms used to describe his invention. *In re Paulsen*, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994). In this regard, words which are defined in the specification must be given the same meaning when used in a claim. *McGill, Inc. v. John Zink Co.*, 736 F.2d 666, 674, 221 USPQ 944, 949 (Fed. Cir.), cert. denied, 469 U.S. 1037 (1084). "The specification aids in ascertaining the scope and meaning of the language employed in the claims in as much as words must be used in the same way in both the claims

and the specification." *In re ZMI Corp., "The Cardiac Resuscitator."* 844 F.2d 1576, 6 USPQ2d 1557, 1560 (Fed. Cir. 1988).

Thus, claim interpretation requires that during examination, "claims yet unpatented are to be given broadest reasonable interpretation consistent with specifications during examination of patent application" *In re Prater*, 415 F.2d 1493 (1969). This standard is also provided as the standard of claim interpretation under MPEP §2111 which recites that "during patent examination, the pending claims must be given the broadest reasonable interpretation consistent with the specification.

The Office Action fails to provide a *prima facie* case of anticipation by showing that the invention described in the claims of this application was patented or described in a printed publication more than one year prior to the date of application for this patent. Moreover, the Office Action fails to give proper interpretation to the claim terms as required by the Courts and the U.S. Patent and Trademark Office according to the Manual of Patent Examination Procedure. Finally, the Office Action fails to give patentable weight to each and every feature recited in the rejected claims.

1. Claims 32-44 Are Not Anticipated by U.S. Patent 4,775,944 to Nakamura

It is alleged in the Office Action that Nakamura discloses each and every feature recited in claims 32-44.

a. Nakamura Does Not Disclose Each and Every Feature Recited in the Rejected Claims

Nakamura discloses a system which calculates the optimum operation condition of an air conditioner and/or hot water supplying apparatus using the operating state information of a central heat source, weather information, the indoor atmosphere information and a consumer's request, and displays the optimum operating condition on the consumer's display unit.

Therefore, the consumer can easily operate the air conditioning and/or hot water supplying apparatus by obeying the displayed message (col. 4, lines 1-13 of Nakamura).

The various messages displayed on the consumer's display unit are drawn up and transmitted to an output terminal device 14 in each of a number of dwelling units via their respective controllers 12 (col. 3, lines 1-5). The messages displayed to the consumer include promotional information that teaches a desired or preferable operation, incentive information that teaches the advantages to the consumer when the consumer cooperates in making the heat load even or saving energy, discouragement information which indicates the irrationality of certain kinds of operation of the air conditioning apparatus or warns not to operate in such a fashion, and penalty information that imposes a penalty when certain kinds of operation of the air conditioner are performed (col. 3, lines 44-65).

Thus, Nakamura does not disclose a controller operably connected to a sensor system and an air delivery system for delivering outside ventilation air to an interior space that ... calculates a predicted indoor air temperature range and a predicted outdoor temperature range based on the stored outdoor air temperature and the stored indoor air temperature, and regulates operation of the air delivery system as a function of predicted indoor and outdoor air temperatures and a predetermined indoor air temperature range, as claimed. Rather, Nakamura merely discloses generating messages to be forwarded to a consumer to provide information regarding operation of the heating and cooling system.

It is alleged in the Office Action that the controller in Nakamura that is described as forwarding messages such as promotional information to a consumer corresponds to the controller recited in the rejected claims because "the broadest reasonable interpretation of the claims of the instant invention requires, for example, that, since no specific structures recited in the claims to distinguish the controller of the instant invention from known prior art

controllers, that any prior art controller operably connected to a sensor system and an air delivery system be readable on the controller as recited in the claims of the instant invention."

Such interpretation of the claimed subject matter conflicts with the holdings of the Courts and the rules of patent examination as provided in the Manual of Patent Examination Procedure. For example, the standard of claim interpretation during patent examination according to MPEP §2111 is to give the pending claims the broadest reasonable interpretation consistent with the specification. This rule of patent examination is consistent with the holdings of *In re Prater*. Therefore, to interpret the controller recited in the rejected claims so broadly that "any prior art controller operably connected to a sensor system and an air delivery system be readable on a controller" is improper and fails to comply with the rules of patent examination. Rather, the terms of the claims should be given their broadest reasonable interpretation to one of ordinary skill in the art in the context of the specification. As Nakamura fails to disclose a controller that performs each and every feature recited in the rejected claims, Nakamura fails to anticipate the rejected claims.

b. Functional Language Must Be Given Patentable Weight

It is further alleged in the Final Rejection that the controller lacks specific structure and that functional limitations not supported by corresponding recitation of distinguishing structure "do not impart patentability to apparatus claims where the prior art anticipates the claim structure of limitations of the apparatus claims." It is further stated in the Office Action that "little or no patentable weight is given to purely functional language and optional/conditional limitations in the apparatus claims."

The refusal to give patentable weight to the functional language of the controller does not comply with the rules of patent examination. Rather, functional language that distinguishes a controller of the claims over the applied reference must be considered by the

Patent Office. As stated in MPEP §2173.05(g), "there is nothing inherently wrong with defining some part of an invention in function terms ... a functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used."

In this case, one of ordinary skill in the art would understand that a controller that performs a particular function must be programmed or hardwired, etc., in order to be capable of performing that function. Thus, the functional limitations in the claims, which define the functions performed by the controller, further limit the claims and further define the structure of the controller. Moreover, there is no corresponding description of any such controller in the system of Nakamura, nor is there any indication that the controller in Nakamura is capable of performing the claimed functions, or is otherwise structured, to perform those functions.

It is well settled that describing a controller by its function is acceptable and patentable subject matter in apparatus claims. In *In re Bradley*, 600 F.2d 1807, 202 USPQ 480 (CCPA 1979). In *Bradley*, the Court reversed a rejection of claims drawn to an apparatus formed to a "firmware" module for altering information in the system of a base computer, the Court stated that "of importance is the significance of the data in their manipulation in the real world, i.e., what the computer is doing." In other words, the function of the firmware module in the apparatus.[1] Thus, the functions of a computer in an apparatus claim have been held to have patentable weight and are accorded patentability.

Moreover, it has been held that if a computer is programmed in certain new and unobvious ways, the newly programmed computer is patentable as a new and useful improvement. *Application of Bernhardt*, 417 F.2d 1395, 1400 (1969). In Bernhardt, the

[1] As to the status of "firmware" generally as statutory subject matter, the Court noted that "firmware is a term of art in the computer field and refers to micro-instructions permanently embodied in hardware elements."

Examiner and the Board both held that "the provision of new signals to be stored by the computer does not make it a new machine, i.e., it is *structurally* the same, no matter how new, useful and unobvious the result" (emphasis in the original). In response to the finding of the Board and the Examiner, the Court said that "if a machine is programmed in a certain new and unobvious way, it is physically different from the machine without that program; its memory elements are differently arranged. The fact that these physical changes are invisible to the eye should not tempt us to conclude that the machine has not been changed".

Accordingly, as is well settled by the Courts, the Examiner's refusal to give patentable weight to the functional features of the controller in this application recited in the claims is improper. Additionally, the Examiner's reliance on "any prior art controller" being readable on the controller in the claims because no specific structure is recited in the claims is in direct conflict with the Courts and the MPEP and is therefore incorrect. Because Nakamura fails to disclose a controller that performs the functions as recited in the rejected claims, Nakamura fails to disclose the structural features of the controller recited in the rejected claims.

c. A Consumer Cannot Correspond To A Controller

Finally, it is also alleged in the Final Office Action, that because the consumer can operate the air conditioner of Nakamura according to the messages provided by the controller 12, the controller of the rejected claims is anticipated. This reasoning as a basis for rejecting the claims also conflicts with the holdings of the Court and proper examination of the claims in accordance with U.S. Patent Practice. Functional language describing a computer in a system claim may not include intervention by a human being because "the case law precludes a conclusion that a human being is a corresponding structure, or an equivalent to a structure under 35 U.S.C. §112, paragraph 6." *Default Proof Credit Card System, Inc. v. Home Depot*

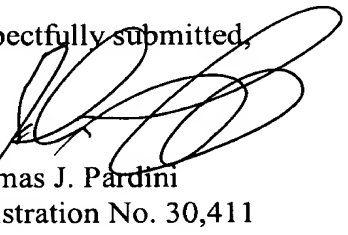
USA, Inc., 412 F.3d 1291, 1297. Therefore, the consumer in Nakamura fails to correspond to the claimed controller.

Because the applied reference to Nakamura fails to disclose a controller capable of executing the control of the system for using outside ventilation air to maintain indoor comfort and air quality, Nakamura fails to anticipate the rejected claims. The rejection of the claims under §102(b) should thus be reversed.

VIII. CONCLUSION

For all of the reasons discussed above, it is respectfully submitted that the rejections are in error and that claims 32-51 are in condition for allowance. For all of the above reasons, Appellants respectfully request this Honorable Board to reverse the rejection of claims 32-44, rejoin claims 45-51 and allow all pending claims.

Respectfully submitted,



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APPENDIX A - CLAIMS APPENDIX

CLAIMS INVOLVED IN THE APPEAL:

1- 31. (Canceled)

32. A system for using outside ventilation air to maintain indoor comfort and air quality, comprising:

a sensor system for detecting outdoor and indoor air temperatures;

an air delivery system for delivering the outside ventilation air to an interior space; and

a controller, operably connected to the sensor system and the air delivery system, that:

receives an outdoor air temperature and an indoor air temperature detected by the sensor system;

stores the detected outdoor air temperature and the detected indoor air temperature detected by the sensor system;

calculates a predicted indoor temperature range and a predicted outdoor temperature range based on the stored outdoor air temperature and the stored indoor air temperature; and

regulates operation of the air delivery system as a function of predicted indoor and outdoor air temperature ranges and a predetermined indoor air temperature range.

33. The system of claim 32, further comprising a user interface that displays the predicted and predetermined indoor air temperature ranges and is operably connected to the controller.

34. The system of claim 32, further comprising a communication link connected to the controller for connection to an outside data source.

35. The system of claim 34, wherein the communication link obtains a weather prediction.

36. The system of claim 32, wherein the controller regulates an indoor air temperature at which cooling by the outside ventilation air is discontinued based on predicted temperatures.

37. The system of claim 32, wherein the controller regulates an airflow rate based on predicted temperatures.

38. The system of claim 33, wherein the controller regulates an airflow rate based on the desired indoor air temperature range.

39. The system of claim 32, wherein the controller controls an airflow rate of the outside ventilation air in proportion to a cooling demand.

40. The system of claim 32, wherein the controller controls the air quality by regulating a volume of the outside ventilation air delivered by the air delivery system.

41. The system of claim 32, further comprising an air conditioner, wherein the controller operates the air conditioner during early morning hours to pre-cool a building.

42. The system of claim 34, wherein the controller regulates operation of the air delivery system based on information received from the outside data source over the communication link.

43. The system of claim 32, wherein the controller activates the air delivery system when the outdoor air temperature is lower than the indoor air temperature.

44. The system of claim 32, wherein the air delivery system includes at least one of a vapor compression unit and an evaporative cooling unit to cool the outside ventilation air.

45. A method of maintaining indoor air comfort and air quality with the system of claim 32 connected to an interior space, the method comprising:

detecting an outdoor air temperature and an indoor air temperature;

storing the detected outdoor air temperature and the detected indoor air temperature;

calculating a predicted indoor temperature range and a predicted outdoor temperature range based on the stored outdoor air temperature and the stored indoor air temperature; and

regulating operation of an air delivery system to deliver outside ventilation air into the interior space as a function of the predicted indoor and outdoor air temperature ranges and the predetermined indoor air temperature range.

46. The method of claim 45, further comprising inputting a desired indoor air temperature through a user interface.

47. The method of claim 45, further comprising connecting the controller to an outside data source via a communication link.

48. The method of claim 47, further comprising obtaining a weather prediction via the communication link.

49. The method of claim 45, further comprising regulating an indoor air temperature by controlling movement of outside ventilation air based on predicted temperatures.

50. The method of claim 45, further comprising activating at least one of a vapor compression unit and an evaporative cooling unit to cool outside ventilation air.

51. The method of claim 45, further comprising activating the air delivery system when the outdoor air temperature is lower than the indoor air temperature.

APPENDIX B - EVIDENCE APPENDIX

NONE

APPENDIX C - RELATED PROCEEDINGS APPENDIX

NONE